Table I. *Coagulation factors in 15 patients who had protein C and protein S levels below the normal range*

	Age (yr)		
	1-5	*6-10*	*11-16*
No. of patients	4	8	3
Protein C (%)	42	46	52
	47	39	48
	33	49	57
	30	46	
		51	
		44	
		32	
		39	
No. of patients	1	2	1
Protein S (%)	52	47	46
		39	

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12/8/87535

New valid technique for ventricular septal defect associated with aortic regurgitation

To the Editor:

We read with great interest the article by Yacoub and associates[1] concerning the ideal means of total repair of ventricular septal defect (VSD) associated with prolapse of the aortic cusp through a transaortic approach alone. The authors appear to recognize that current operative procedures, which have been considered essentially definitive, leave much room for improvement. In supplemental discussion, they raise questions concerning the validity of direct closure of the VSD just beneath the pulmonary valve and the necessity for plication of the prolapsed sinus of Valsalva for mild aortic regurgitation (AR). On the basis of our own experience, we support the use of their new technique.

Concerning the method of VSD closure in the conal area, especially with a large subpulmonary VSD, Spencer and associates[2] suggested that direct closure produced a downward displacement of the aortic anulus and destruction of its commissural support. Kawashima and colleagues[3] also suggested that it seemed dangerous to approximate the pulmonic ring to the lower margin of the defect, because doing so might result in subsequent tearing of the tissue and recurrence of the defect. Following their suggestions, we also performed patch closure for this type of VSD. However, since 1995 we have performed direct closure in five patients with a subpulmonary type of VSD with mild AR. We inserted an interrupted 4-0 or 5-0 polypropylene suture with a pledget from the lower margin of the VSD to the pulmonary ring to increase protrusion of the prolapsed cusp by pushing it back and to improve coaptation of the aortic cusp through the pulmonary artery. As a result, the prolapsing aortic cusp and mild AR disappeared and no anatomic changes in either the aortic or pulmonic anulus were found on follow-up echocardiography. Furthermore, postoperative murmur, which appears sometimes to result from the use of a patch, was detected in none of the patients.

Recently, the incidence of moderate or more severe AR associated with this type of VSD has markedly decreased, because patients are immediately referred for closure of the VSD when progression of prolapse of the aortic cusp or the occurrence of AR is detected. Consequently, the number of patients needing valvuloplasty has decreased. However, the problem of degeneration of the repaired aortic valve has been considered on long-term follow-up for patients who have undergone excessive valvuloplasty for AR. To prevent direct excessive manipulation of the cusps to the repair, we[4] have also used aortoplasty (plication of the aorta) to achieve protrusion of the cusp when coaptation is not improved after plication of the prolapsed cusp. Taking into consideration the long-term results, Yacoub's plication maneuver also seems likely to improve coaptation of the cusps without the need to touch them, especially in patients with moderate or severe AR.

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12/8/84302

Reply to the Editor:

My colleagues and I read with interest the comments by Hisatomi and his colleagues. We agree that direct closure of the ventricular septal defect in this syndrome does not produce abnormal displacement of the aortic anulus, "destruction of the commissural support," or any undue tension on the lower margin of the defect. The reason is that one of the basic abnormalities in the syndrome is the presence of excessive redundant tissue produced by dilatation of the aortic sinus, which results in downward and

outward displacement of the anulus into the right ventricle. Direct closure of the defect combined with plication of the sinus, as described in our article (J Thorac Cardiovasc Surg 1997;113:253-61), corrects these abnormalities. In contrast, insertion of patches will add to the redundant tissue and does not restore the position of the aortic anulus and cusp to treat or prevent subsequent aortic regurgitation. With regard to the choice of a transaortic or transpulmonary approach, we believe that the transaortic approach offers many advantages, which include the capacity to plicate the thin part of the dilated sinus and accurately attach the crest of the ventricular septum and anulus to the edge of the normal aortic media, below the coronary orifice. In addition, the aortic valve can be assessed and any additional procedures to restore competence can be considered. In this regard, we agree fully with Hisatomi and colleagues that earlier operation obviates the need for aortic valvuloplasty and that maneuvers designed to avoid direct operations on the cusp are preferable. With the widespread use of echocardiography and the distinct and easily detectable echocardiographic features of the syndrome, it should be possible to diagnose and correct the defect before the development of secondary changes in the cusps.

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12/8/84303

Thoracic duct ligation for chylopericardium

To the Editor:

In the August 1997 issue of the Journal (1997;114:299), Yüksel and associates stated "no such approach [thoracotomy for ligation of the thoracic duct] to isolated primary chylopericardium has been described in the literature." My colleagues and I[1] described such an approach in 1990 in a case report published in the *Journal of Pediatric Surgery.* A child with primary chylopericardium had initial left thoracotomy and pericardial window, followed by a no-fat diet. This was unsuccessful (recurrent chylopericardium). Two weeks later he had a right thoracotomy with ligation of the thoracic duct. This was successful, and on long-term follow-up he has had no recurrence of the chylopericardium.

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12/8/87534

Reply to the Editor:

In the article by Musemeche and associates,[1] they reported the case of a 12-year-old boy with primary chylopericardium who was unresponsive to initial treatment with left thoracotomy and pericardial window followed by a no-fat diet. Two weeks later, because of recurrence of the chylopericardium, they performed a right thoracotomy with ligation of the thoracic duct.

In our letter to the Editor,[2] we discussed a patient with a chylopericardium who was treated by thoracoscopic thoracic duct ligation and pericardial fenestration. We think that Dr. Backer misunderstands what we meant. The sentence "no such approach to isolated chylopericardium has been described in the literature" did not mean that thoracotomy for ligation of the thoracic duct had not been described for the treatment of primary chylopericardium. What we would like to state is that there is no universally accepted method of managing primary chylopericardium, whereas there is an accepted algorithm for the therapy of chylothorax[3] (chest tube insertion, a medium-chain triglyceride diet for 2 weeks, and then surgery). On the other hand, we agree with Dr. Backer that early thoracic duct ligation combined with partial pericardiectomy is the treatment of choice for primary chylopericardium.

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Aortopulmonary paraganglioma: An overview after five years

To the Editor:

In December 1993, we published a case report in this Journal[1] concerning a paraganglioma in the aortic arch of a 64-year-old woman. The operation was performed on June 21, 1991. In this report we specifically emphasized the importance of conventional angiography over aortography by digital substraction for making an early diagnosis.

Later, in a letter to the Editor, Lacquet[2] suggested a list of recommendations and comments we should follow in diagnosis of possible new locations of paraganglioma or Carney's triad.[3]

Our patient has been seen annually in our center and has had no symptoms indicative of any complications. In